Description

System and method for direct communication between automation appliances

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The invention relates to a system and a method for communication and/or transmission of information between automation devices via a data transmission system.

10   The automation devices which are located on a site, in particular control devices such as stored programmable controls or digital controls but also display devices such as operator panels, normally exchange messages or information with each other. To this end, the automation devices today are connected to each other via networks,
15   in particular field bus systems. In this context, the communication between the participating automation devices takes place via so-called protocols, i.e. descriptions of how the participating devices communicate with each other. In the case of the bus systems which are used today, use is made of so-called proprietary protocols which
20   are not based on a standard. The communication between the participating automation devices normally takes place via central data processing units, which are likewise connected to the bus system and which forward incoming messages or information from the automation devices to the relevant addressees.

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DE 100 38 557 A1 discloses a system and a method for transmitting data via data networks, in particular via an Internet with asynchronous data connection. In this context, a so-called client-server connection via a permanently open data connection makes it
30   possible to send data from the server to the client at any time, independently of actions of the client.

The invention addresses the problem of specifying a system and a method whereby the information exchange can be bidirectional between the participating automation devices, and whereby the communication can be initiated by any of the participating automation devices.

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This object is achieved by a system for communication and/or transmission of information between automation devices via a data transmission system, wherein an automation device which participates in the system has means for sending and/or receiving requests and/or

10   replies, and wherein the means are used for direct communication and/or transmission of information between the automation devices. The invention is based on the perception that the automation devices on a site today satisfy increasingly complex tasks. Consequently, the automation devices also require increasing amounts of

15   information, in particular information from other automation devices which are present on the site, in order to be capable of properly performing their function. The required data includes e.g. process values from a site, but also messages, alarms or whole programs or software components which an automation device requires for

20   executing a task. Therefore the exchange of information between the automation devices on a site is becoming increasingly important. Maximum benefit is naturally gained if partners participating in a communication, said partners being the automation devices in this case, can send the information which is required for the

25   communication directly to the relevant recipient or, if information is needed, can submit requests directly to other participating partners. Collection and management of requests and replies at a central point, e.g. on a data processing device, would delay the flow of information and generate unnecessary management burdens.

30   Therefore the system according to the invention for communication is evidently advantageous since the participating communication partners, i.e. the automation devices, can communicate directly with each other and the requested information can also be sent directly from one of the participating automation devices to the automation

35   device which originally submitted the request. Using a direct communication such as this, each of the participants can both collect information and make information available.

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Patent claims

1. A system (9) for communication and/or transmission of information
(8) between automation devices ($1_{1..n}$) via a data transmission system
5 (2),

- wherein an automation device (1_i) which participates in the system
  (9) has means (4) for sending and/or receiving requests and/or
  replies, and
- wherein the means (4) are used for direct communication and/or
10 transmission of information (8) between the automation devices
  ($1_{1..n}$).

2. The system according to Claim 1,
characterized in that
15 the means (4) are used for peer-to-peer communication between the
automation devices (1).

3. The system according to one of the Claims 1 or 2,
characterized in that
20 the data transmission system (2) is developed as an Intranet and/or
Internet (3).

4. The system as according to one of the Claims 1 to 3,
characterized in that
25 the means (4) for sending and/or receiving are developed as a basic
service of an operating system for communication.

5. The system according to one of the preceding Claims 1 to 4,
characterized in that
30 each automation device (1_i) is used for sending a request (6) via the
data transmission system (2) to all other automation devices ($1_{1..n}$)
of which it has knowledge.

6. The system according to one of the preceding Claims 1 to 5,
35 characterized in that
all automation devices ($1_{1..m}$) are used for forwarding a request (6),
which arrives via the sending and/or receiving means (4), to all
other automation devices which it knows ($1_{m+1..n}$), which have not yet
received the request (6).

7. The system according to one of the preceding Claims 1 to 6,
c h a r a c t e r i z e d i n t h a t
the automation devices $(1_{1..n})$ are used for sending an address (7) to
5   the automation device (1_i) which submitted the request (6).

8. The system according to one of the preceding Claims 1 to 7,
c h a r a c t e r i z e d i n t h a t
the means (4) for sending and/or receiving on the automation devices
10   $(1_{1..n})$ are used for the direct collection of information (8) from
automation devices $(1_{1..n})$ which make information (8) available at the
address (7) which has been sent.

9. The system according to one of the preceding Claims 1 to 8,
15   c h a r a c t e r i z e d i n t h a t
the request (7) has means for canceling its forwarding through the
automation devices $(1_{1..n})$ on the basis of a time limit.

10. The system according to one of the preceding Claims 1 to 9,
20   c h a r a c t e r i z e d i n t h a t
a device (5) which is connected to the data transmission system (2)
is used for managing the addresses (7) of the participating
automation devices $(1_{1..n})$.

25   11. A method for communication and/or transmission of information
(8) between automation devices $(1_{1..n})$ via a data transmission system
(2),

   • in which each participating automation device (1_i) sends and/or
     receives requests and/or replies, and
30   • in which the communication and/or transmission of information (8)
     takes place directly between the automation devices $(1_{1..n})$.

12. The method according to Claim 11,
c h a r a c t e r i z e d   i n   t h a t
the communication between the automation devices (1) takes place in
the form of peer-to-peer communication.

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13. The method according to Claim 11 or 12,
c h a r a c t e r i z e d   i n   t h a t
the communication and/or transmission of information (8) takes place
via an Intranet and/or Internet (3).

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14. The method according to one of the Claims 11 to 13,
c h a r a c t e r i z e d   i n   t h a t
communication takes place via a basic service of an operating
system.

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15. The method according to one of the Claims 11 to 14,
c h a r a c t e r i z e d   i n   t h a t
each automation device (1_i) sends a request (6) via the data
transmission system (2) to all other automation devices ($1_{1..n}$) of

20 which it has knowledge.

16. The method according to one of the Claims 11 to 15,
c h a r a c t e r i z e d   i n   t h a t
all automation devices ($1_{1..m}$) forward a request (6), which arrives

25 via the sending and/or receiving means (4), to all other automation
devices which it knows ($1_{m+1..n}$), which have not yet received the
request (6).

17. The method according to one of the Claims 11 to 16,

30 c h a r a c t e r i z e d   i n   t h a t
the automation devices ($1_{1..n}$) send an address (7) to the automation
device (1_i) which submitted the request (6).

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18. The method according to one of the Claims 11 to 17, characterized in that
the automation devices ($1_{1..n}$) directly collect information (8) from automation devices ($1_{1..n}$) which make information (8) available at the
5   address (7) which has been sent.

19. The method according to one of the Claims 11 to 18, characterized in that
the forwarding of the request (7) through the automation devices
10 ($1_{1..n}$) is canceled on the basis of a time limit.

20. The method according to one of the Claims 11 to 19, characterized in that
the addresses (7) of the participating automation devices ($1_{1..n}$) are
15 managed by a device (5) which is connected to the data transmission system (2).

21. An automation device (1_i) for communication with and/or transmission of information (8) to and from further automation
20 devices ($1_{1..n}$) via a data transmission system (2),

- wherein the automation device (1_i) has means (4) for sending and/or receiving requests and/or replies, and

- wherein the means (4) are used for direct communication and/or transmission of information (8) between the automation devices
25 ($1_{1..n}$).

22. The automation device according to in Claim 21, characterized in that
the means (4) are used for peer-to-peer communication between the
30 automation devices (1).

23. The automation device according to the Claims 21 or 22,
characterized in that
the means (4) for sending and/or receiving are developed as a basic
service of an operating system for communication.

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24. The automation device according to the Claims 21 to 23,
characterized in that
the automation device (1_i) is used for sending a request (6) via the
data transmission system (2) to all other automation devices $(1_{1..n})$

10   of which it has knowledge.

25. The automation device according to the Claims 21 to 24,
characterized in that
the automation device (1_i) is used for forwarding a request (6),

15   which arrives via the sending and/or receiving means (4), to all
other automation devices which it knows $(1_{1..n})$, which have not yet
received the request (6).

26. The automation device according to the Claims 21 to 25,
20   characterized in that
the automation device (1_1) is used for sending an address (7) to an
automation device $(1_{1..n})$ which submits a request (6).

27. The automation device according to the Claims 21 to 26,
25   characterized in that
the means (4) for sending and/or receiving on the automation devices
(1_i) are used for the direct collection of information (8) from
automation devices $(1_{1..n})$ which make information (8) available at the
address (7) which has been sent.